

NOTES ON WESTERN LEATHERWOOD, *DIRCA*
OCCIDENTALIS GRAY

H. E. McMINN AND BEATRICE FORDERHASE

Western Leatherwood is one of two known species of the genus *Dirca*. This genus is one of about forty genera belonging to the Mezerium Family (Thymelaeaceae) which is composed largely of shrubs and trees widely distributed in the temperate and tropical zones. *Dirca*, like most of the other genera in this family, has rather a limited distribution, being found in only two widely separated regions in North America. One species, *Dirca palustris* L., grows in woods and along streams from New Brunswick westward to Minnesota and southward to Florida. The other species, *Dirca occidentalis* Gray (fig. 1), is a rare shrub inhabiting moist shady slopes in a few localities of the San Francisco Bay region of California. The known localities are in the Oakland, Berkeley, and San Leandro hills of Alameda and Contra Costa counties, in the foothills of the mountains west of Palo Alto in San Mateo and Santa Clara counties, and in Marin County (Lagunitas, Mrs. A. M. Gilbert).

Dirca occidentalis is an erect deciduous shrub, 2 to 8 feet high, with numerous ascending branches forming an inverted-pyramidal crown. The bark is smooth, leathery, and varies from gray to dark brown or almost black. The wood is soft but very tough and flexible. Branches as much as three-eighths inch in diameter can be tied into knots with ease. The leaves, appearing after the flowers, are simple, alternate, broadly elliptic or oval to obovate, 1 to 3 inches long, rounded at base and apex, entire, light green and glabrous above, paler and slightly pubescent beneath especially along the veins when young, and short-petioled. The flowers are pale yellow and are borne in outward and downward pointed clusters of two to four from small axillary and terminal buds which also bear the leaves. The bud-scales are densely white- or yellow-villous, inconspicuous until the buds begin to expand, and then they appear at the nodes as silvery hairy "domes." Each flower is composed of a tubular 4- (or rarely 5-) lobed corolla-like calyx about one-third inch long, 8 to 10 exserted stamens, and a single simple pistil with a sessile superior 1-ovuled ovary and a slender style longer than the stamens. The fruit is a semiglobular reddish drupe one-fourth to one-half inch long, but it rarely develops in any quantity. The blooming period occurs from January to March, varying with the seasons.

The flexible and leathery nature of the stems and branches can be partially accounted for by the number and peculiar arrangement of the xylem vessels (pl. III, fig. 1). In most genera

of angiospermous plants the vessels constitute a large proportion of the wood and are generally arranged in definite patterns of rows and masses. In the stem of western leatherwood the vessels occupy less than one-sixth of the wood and they are arranged in irregular C- or S-shaped bands scattered throughout the wood. The walls of the vessels are relatively thick and highly lignified, thus giving them great rigidity. Examination of the accompanying photomicrographs (pl. III, figs. 1, 2) shows that the bulk of the wood is composed of wood fibers arranged



Fig. 1. Late winter branches of *Dirca occidentalis* with buds and flowers.

in definite radial rows. The walls of the wood fibers are lignified and relatively thin. This radial arrangement of cells is characteristic of all secondary tissue formed from the cambium, but in many instances it is soon altered by subsequent differentiation.

At the conclusion of each year's growth one or two rows of wood parenchyma can be distinguished by the slightly darker appearance of the cell walls. This arrangement of wood parenchyma is generally referred to as terminal. The walls of these cells are composed of cellulose and are rather thin. The only other elements

of the wood are xylem ray cells which can be distinguished in the photomicrographs as narrow, radiating bands of cells elongated in the direction of the long axis of the rays.

In the opinion of the writers the great flexibility of the stems and branches would be accounted for by the C- or S-shaped arrangement of the narrow bands of xylem vessels, by the radial arrangement of the wood fiber cells and the thinness of their

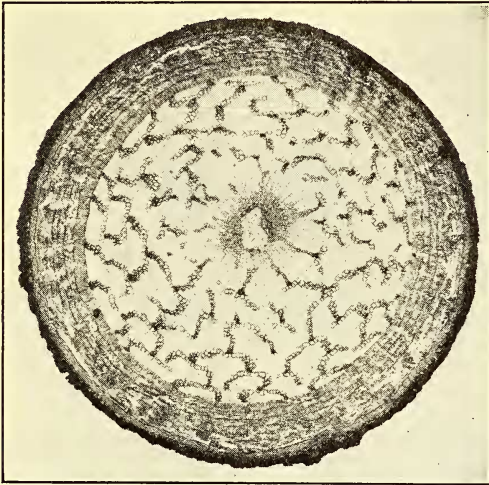


Fig. 1. Cross section of 6-year-old stem of *Dirca occidentalis* showing C- or S-shaped arrangement of xylem vessels. Photomicrograph.

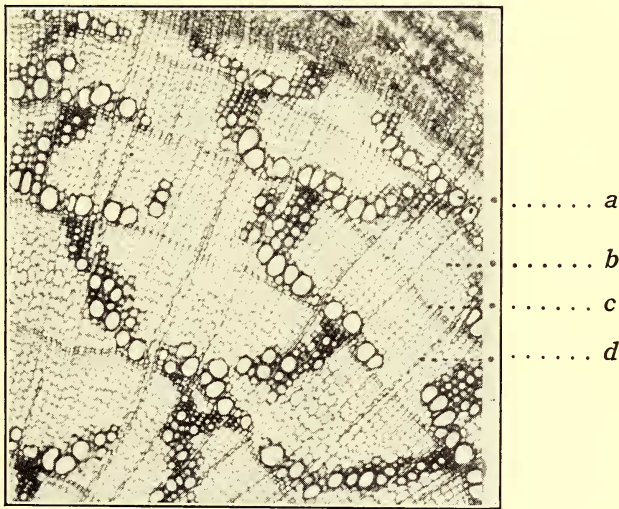


Fig. 2. Portion of the cross section of wood of *Dirca occidentalis*: a, xylem vessels; b, wood fibers; c, wood parenchyma; d, xylem ray. Enlarged photomicrograph.

PLATE III. *DIRCA OCCIDENTALIS*: STRUCTURE OF WOOD.

walls, and by the terminal position of the wood parenchyma cells and the thinness and cellulose nature of their walls.

The plants are very ornamental in their native habitat during late winter or early spring. The yellowish-green young foliage stands out in sharp contrast to the dark green foliage of the associated shrubs. Branches cut just as the silvery bud-scales are being pushed out by the expanding buds will continue to grow when placed in water until the flowers and leaves are completely developed. They make a unique and ornamental bouquet when other plant materials are not abundant.

Attempts at transplanting these shrubs into gardens have not been very successful. In nature they propagate by sending up new plants from underground stems which run parallel to the surface of the ground in the upper layer of loose soil which is usually covered by 3 to 6 inches of leaf mold. The roots penetrate the soil to great depths and it is difficult to find young plants without long roots or which are not connected to the parent plants.

The extremely limited distribution, the ornamental nature of the buds, flowers, and foliage, and the flexibility of the stems and branches make western leatherwood one of the most interesting of the California native shrubs.

Mills College, February, 1935.

THE WASHINGTON SPECIES AND VARIETIES OF ROSA

GEORGE NEVILLE JONES

In 1906 Piper (6, pp. 334-335) recorded only three species of *Rosa* for Washington. In 1915, one additional species, an adventive, was included (7, pp. 204-205). In the present paper¹ an attempt is made to record some of the distinguishing characteristics and distributional facts concerning the four non-native and the five native species (Linneons) and their several varieties. Two new varieties are proposed. The geographical distribution of the different species and varieties in Washington is shown in figure 1. An attempt is made to correlate taxonomic characters with geographical distribution and to furnish a usable key for identification of the plants. The application of this taxonomic-geographic method has aided in the solution of several perplexing problems of identity and relationship and has also pointed to the probability that one of the best methods of solving such problems is to be found in a local study of a small number of species over a long period of time. During a six year study of Washington roses in the field and in the herbarium no direct evidence of hybridity has been noted. This

¹ Since this paper was written there has appeared an excellent summary of certain data concerning the North American Cinnamomeae, by Dr. E. W. Erlanson (2).